

What is claimed is:

1. A method of minimizing the degradation of an acid-sensitive additive by at least one acidulent in a low-moisture comestible, confectionery, pharmaceutical or dentifrice product which contains the at least one acidulent, comprising preparing the product with the at least one acidulent in the form of a co-processed composition; wherein the co-processed composition is prepared by co-processing the at least one acidulent with at least one water-soluble crystalline compound independently chosen from the group consisting of sugar alcohols, sugars, and derivatives thereof.

2. The method of claim 1, wherein the product is chosen from the group consisting of chewing gum, bubble gum, instant beverages, frozen desserts, toothpaste, and dental floss.

3. The method of claim 2, wherein the product is a chewing gum.

4. The method of claim 1, wherein the at least one acidulent is an inorganic or organic acid or a salt thereof.

5. The method of claim 4, wherein the acid is an inorganic acid chosen from the group consisting of phosphoric acid, perchloric acid, nitric acid, hydrochloric acid, sulfuric acid, and boric acid.

6. The method of claim 4, wherein the acid is chosen from the group consisting of saturated and unsaturated hydroxy and non-hydroxy C<sub>1</sub> to C<sub>6</sub> mono-, di-, and tribasic carboxylic acids.

7. The method of claim 6, wherein the acid is chosen from the group consisting of citric acid, fumaric acid, tartaric acid, malic acid, succinic acid, ascorbic acid, glutaric acid, adipic acid, lactic acid, hydroxyacetic acid and mixtures thereof.

8. The method of claim 1, wherein the at least one water-soluble crystalline compound is a sugar alcohol.

9. The method of claim 8, wherein the sugar alcohol is chosen from the group consisting of mannitol, sorbitol, maltitol, xylitol, lactitol, erythritol, isomalt, and mixtures thereof.

10. The method of claim 9, wherein the sugar alcohol is mannitol.

11. The method of claim 1, wherein the at least one water-soluble crystalline compound is a sugar.

12. The method of claim 11, wherein the sugar is chosen from the group consisting of fructose, dextrose, maltose, lactose, D-tagatose, sucrose and longer chain saccharides and mixtures thereof.

13. The method of claim 1, wherein the comestible, confectionery, pharmaceutical or dentifrice product contains less than about 10 wt.% moisture.

14. The method of claim 13, wherein the comestible, confectionery, pharmaceutical or dentifrice product contains less than about 5 wt.% moisture.

15. The method of claim 13, wherein the comestible, confectionery, pharmaceutical or dentifrice product contains less than about 3 wt.% moisture.

16. A method of increasing salivation comprising the step of chewing a low-moisture comestible, confectionery, pharmaceutical or dentifrice product containing at least one acidulent; said product comprising the at least one acidulent in the form of a co-processed composition, wherein said co-processed composition is prepared by co-processing the at least one acidulent with at least one water-soluble crystalline compound independently chosen from the group consisting of sugar alcohols, sugars, and derivatives thereof.

17. The method of claim 16, wherein the product is chosen from the group consisting of chewing gum, bubble gum, instant beverages, frozen desserts, toothpaste, and dental floss.

18. The method of claim 17, wherein the product is chewing gum.

19. The method of claim 16, wherein the at least one acidulent is an inorganic or organic acid or salt thereof.

20. The method of claim 19, wherein the at least one acidulent is an inorganic acid chosen from the group consisting of phosphoric acid, perchloric acid, nitric acid, hydrochloric acid, sulfuric acid, and boric acid.

21. The method of claim 19, wherein the at least one acidulent is an organic acid chosen from the group consisting of saturated and unsaturated hydroxy and non-hydroxy C<sub>1</sub> to C<sub>6</sub> mono-, di-, and tribasic carboxylic acids.

22. The method of claim 21, wherein the at least one acidulent is chosen from the group consisting of citric acid, fumaric acid, tartaric acid, malic acid, succinic acid, ascorbic acid, glutaric acid, adipic acid, lactic acid, hydroxyacetic acid and mixtures thereof.

23. The method of claim 16, wherein the at least one water-soluble crystalline compound is a sugar alcohol.

24. The method of claim 23, wherein the sugar alcohol is chosen from the group consisting of mannitol, sorbitol, maltitol, xylitol, lactitol, erythritol, isomalt, and mixtures thereof.

5 25. The method of claim 24, wherein the sugar alcohol is mannitol.

26. The method of claim 16, wherein the at least one water-soluble crystalline compound is an sugar.

10 27. The method of claim 26, wherein the sugar is chosen from the group consisting of fructose, dextrose, maltose, lactose, D-tagatose, sucrose and longer chain saccharides and mixtures thereof.

28. The method of claim 16, wherein the comestible, confectionery, pharmaceutical or dentifrice product contains less than about 10 wt.% moisture.

15 29. The method of claim 28, wherein the comestible, confectionery, pharmaceutical or dentifrice product contains less than about 5 wt.% moisture.

30. The method of claim 29, wherein the comestible, confectionery, pharmaceutical or dentifrice product contains less than about 3 wt.% moisture.

20 31. A method of removing or preventing the deposition of plaque on teeth, comprising regularly chewing gum; wherein the gum comprises a gum base, an abrasive, and at least one acidulant, wherein the at least one acidulant is in the form of a co-processed composition, and wherein the co-processed composition is prepared by co-processing the at least one acidulant with at least one water-soluble crystalline compound independently chosen from the group consisting of sugar alcohols, sugars, and derivatives thereof.

25 32. The method of claim 31, wherein the abrasive is chosen from the group consisting of calcined kaolin, calcined aluminum silicate, zirconium silicate, calcined and uncalcined talcs,  $Mg_3Si_4O_{10}(OH)_2$ , resin abrasives, barium sulfate, silica, alumina, calcium carbonate, pumice, sodium bicarbonate and mixtures thereof.

33. The method of claim 31, wherein the source of the at least one acidulant is an inorganic or organic acid or a salt thereof.

34. The method of claim 33, wherein the at least one acidulant is an inorganic acid chosen from the group consisting of phosphoric acid, perchloric acid, nitric acid, hydrochloric acid, sulfuric acid, and boric acid.

5 35. The method of claim 33, wherein the acid is an organic acid chosen from the group consisting of saturated and unsaturated hydroxy and non-hydroxy C<sub>1</sub> to C<sub>6</sub> mono-, di-, and tribasic carboxylic acids.

10 36. The method of claim 35, wherein the acid is chosen from the group consisting of citric acid, fumaric acid, tartaric acid, malic acid, succinic acid, ascorbic acid, glutaric acid, adipic acid, lactic acid, hydroxyacetic acid and mixtures thereof.

37. The method of claim 31, wherein the at least one acidulant is present in the product in an amount such that when 1 gram of the product is placed into 9 grams of deionized water and mixed well, the pH is decreased to a level in the range of from about 1 to about 5.

15 38. The method of claim 37, wherein the pH is decreased to a level in the range of from about 1 to about 4.5.

39. The method of claim 38, wherein the pH is decreased to a level in the range of from about 2.8 to about 3.2.

40. The method of claim 31, wherein the at least one water-soluble crystalline compound is a sugar alcohol.

20 41. The method of claim 40, wherein the sugar alcohol is chosen from the group consisting of mannitol, sorbitol, maltitol, xylitol, lactitol, erythritol, isomalt, and mixtures thereof.

42. The method of claim 41, wherein the sugar alcohol is mannitol.

43. The method of claim 31, wherein the at least one water-soluble crystalline compound is a sugar.

25 44. The method of claim 43, wherein the sugar is chosen from the group consisting of fructose, dextrose, maltose, lactose, D-tagatose, sucrose and longer chain saccharides and mixtures thereof.

45. The method of claim 31, wherein the chewing gum contains less than about 10 wt.% moisture.

46. The method of claim 45, wherein the chewing gum contains less than about 5 wt.% moisture.

47. The method of claim 46, wherein the chewing gum contains less than about 3 wt.% moisture.

5 48. A comestible, confectionery, pharmaceutical or dentifrice product comprising at least one acidulent in the form of a co-processed composition; wherein the co-processed composition is prepared by co-processing the at least one acidulent with at least one water-soluble crystalline compound independently chosen from the group consisting of sugar alcohols, sugars, and derivatives thereof.

10 49. The product of claim 48, wherein the product is chosen from the group consisting of chewing gum, bubble gum, instant beverages, frozen desserts, toothpaste, and dental floss.

50. The product of claim 49, wherein the product is chewing gum.

51. The product of claim 48, wherein the at least one acidulent is an inorganic or organic acid or a salt thereof.

15 52. The product of claim 51, wherein the acid is an inorganic acid chosen from the group consisting of phosphoric acid, perchloric acid, nitric acid, hydrochloric acid, sulfuric acid, and boric acid.

20 53. The product of claim 51, wherein the acid is an organic acid chosen from the group consisting of saturated and unsaturated hydroxy and non-hydroxy C<sub>1</sub> to C<sub>6</sub> mono-, di-, and tribasic carboxylic acids.

54. The product of claim 53, wherein the acid is chosen from the group consisting of citric acid, fumaric acid, tartaric acid, malic acid, succinic acid, ascorbic acid, glutaric acid, adipic acid, lactic acid, hydroxyacetic acid and mixtures thereof.

25 55. The product of claim 48, wherein the at least one water-soluble crystalline compound is a sugar alcohol.

56. The product of claim 55, wherein the sugar alcohol is chosen from the group consisting of mannitol, sorbitol, maltitol, xylitol, lactitol, erythritol, isomalt, and mixtures thereof.

57. The product of claim 56, wherein the sugar alcohol is mannitol.

58. The product of claim 48, wherein the at least one water-soluble crystalline compound is a sugar.

5 59. The product of claim 58, wherein the sugar is chosen from the group consisting of fructose, dextrose, maltose, lactose, D-tagatose, sucrose and longer chain saccharides and mixtures thereof.

10 60. The product of claim 48, wherein the product contains less than about 10 wt % moisture.

15 61. The product of claim 60, wherein the product contains less than about 5 wt.% moisture.

62. The product of claim 60, wherein the product contains less than about 3 wt.% moisture.

15 63. A comestible, confectionery, pharmaceutical or dentifrice product comprising an abrasive and at least one acidulant; wherein the at least one acidulant is in the form of a co-processed composition prepared by co-processing the at least one acidulant with at least one water-soluble crystalline compound independently chosen from the group consisting of sugar alcohols, sugars, and derivatives thereof.

20 64. The product of claim 63, wherein the product is chosen from the group consisting of chewing gum, bubble gum, instant beverages, frozen desserts, toothpaste, and dental floss.

65. The product of claim 64, wherein the product is chewing gum.

25 66. The product of claim 63, wherein the source of the at least one acidulant is an inorganic or organic acid or a salt thereof.

67. The product of claim 66, wherein the acid is an inorganic acid chosen from the group consisting of phosphoric acid, perchloric acid, nitric acid, hydrochloric acid, sulfuric acid, and boric acid.

25 68. The product of claim 66, wherein the acid is an organic acid chosen from the group consisting of saturated and unsaturated hydroxy and non-hydroxy C<sub>1</sub> to C<sub>6</sub> mono-, di-, and tribasic carboxylic acids.

30 69. The product of claim 68, wherein the acid is chosen from the group consisting of citric acid, fumaric acid, tartaric acid, malic acid, succinic acid, ascorbic acid, glutaric acid, adipic acid, lactic acid, hydroxyacetic acid and mixtures thereof.

70. The product of claim 63, wherein the at least one water-soluble crystalline compound is a sugar alcohol.

71. The product of claim 70, wherein the sugar alcohol is chosen from the group consisting of mannitol, sorbitol, maltitol, xylitol, lactitol, erythritol, isomalt, and mixtures thereof.

5 72. The product of claim 71, wherein the sugar alcohol is mannitol.

73. The product of claim 63, wherein the at least one water-soluble crystalline compound is a sugar.

74. The product of claim 73, wherein the sugar is chosen from the group consisting of 10 fructose, dextrose, maltose, lactose, D-tagatose, sucrose and longer chain saccharides and mixtures thereof.

75. The product of claim 63, wherein the product contains less than about 10 wt.% moisture.

15 76. The product of claim 75, wherein the product contains less than about 5 wt.% moisture.

77. The product of claim 75, wherein the product contains less than about 3 wt.% moisture.

10 78. A co-processed composition consisting essentially of at least one water-soluble crystalline compound selected from the group consisting of sugar alcohols, sugars and derivatives thereof, and at least one acidulant.

20 79. The co-processed composition of claim 78, wherein the at least one acidulant is selected from the group consisting of citric acid, fumaric acid, lactic acid, tartaric acid and adipic acid.

80. The co-processed composition of claim 78, wherein the at least one acidulant is selected from the group consisting of phosphoric acid and malic acid.

25 81. The co-processed composition of claim 78, wherein said co-processed composition consists essentially of about 80-99 weight percent of said at least one water-soluble crystalline compound and 1-20 weight percent of said at least one acidulant, based on the total weight of said at least one water-soluble crystalline compound and the at least one acidulant.

82. The co-processed composition of claim 78, wherein said co-processed composition is in the form of granules or agglomerates.

83. The co-processed composition of claim 78, wherein said co-processed composition is in the form of powder.

5 84. A process of making a co-processed composition consisting essentially of at least one water-soluble crystalline compound selected from the group consisting of sugar alcohols, sugars and derivatives thereof, and at least one acidulant, comprising the following steps:

- 10 a) mixing said at least one water-soluble crystalline compound, said at least one acidulant and water to form a mixture;
- b) forming said mixture into granules or agglomerates and
- c) removing at least a portion of the water from said granules or agglomerates.

15 85. The process of claim 84, wherein the at least one acidulant is selected from the group consisting of citric acid, fumaric acid, lactic acid, tartaric acid and adipic acid.

86. The process of claim 84, wherein the at least one acidulant is selected from the group consisting of phosphoric acid and malic acid.

87. The process of claim 84, wherein said forming occurs in a wet granulation or agglomeration process.

20 88. Pharmaceutical product, food product or confectionery product containing the co-processed composition of claim 78.

89. A pharmaceutical product, food product or confectionery product containing the co-processed composition of claim 80.

90. A chewing gum containing the co-processed composition of claim 78.

25 91. A chewing gum containing the co-processed composition of claim 80.

92. A pharmaceutical product, food product or confectionery product that contains at least one alkaline ingredient and the co-processed composition of claim 78.

93. A chewing gum that contains at least one acid-sensitive additive and the co-processed composition of claim 78.

30 94. A hard candy containing the co-processed composition of claim 78.

95. A jam, jelly or other soft filling for a food product or confectionery product that contains the co-processed composition of claim 78.

96. A baked product that contains the co-processed composition of claim 78.

5 97. The co-processed composition of claim 78, wherein the at least one water-soluble crystalline compound is mannitol.

98. The process of claim 84, wherein the at least one water-soluble crystalline compound is mannitol.

99. A co-processed composition consisting essentially of mannitol, water and at least one acidulant selected from the group consisting of phosphoric acid and malic acid, wherein said 10 mannitol is present in an amount of from about 80-99% by weight of the co-processed composition, said water is present in an amount of about 0.01% to 2% by weight of the co-processed composition and the remainder of the co-processed composition is said at least one acidulant.

100. The method of claim 3, wherein the at least one acidulant is phosphoric acid, the 15 at least one water soluble crystalline compound is mannitol and the acid-sensitive additive is a flavor.

101. The method of claim 100, wherein the chewing gum further contains kaolin.

102. The method of claim 18, wherein the at least one acidulant is phosphoric acid and the 20 at least one water-soluble crystalline compound is mannitol and wherein the chewing gum further contains an acid-sensitive flavor.

103. The method of claim 102, wherein the chewing gum further contains kaolin.

104. The method of claim 42, wherein the at least one acidulant is phosphoric acid, the abrasive is kaolin and wherein the gum further contains an acid-sensitive flavor.

105. The product of claim 50, wherein the at least one acidulant is phosphoric acid and the 25 at least one water-soluble crystalline compound is mannitol and wherein the chewing gum further contains an acid-sensitive flavor.

106. The product of claim 105, wherein the chewing gum further contains kaolin.

107. The product of claim 65, wherein the at least one acidulant is phosphoric acid and the 30 at least one water-soluble crystalline compound is mannitol and wherein the chewing gum further contains an acid-sensitive flavor.

108. The product of claim 107, wherein the chewing gum further contains kaolin.
109. A chewing gum containing the co-processed composition made by the process of claim 84.
110. The chewing gum of claim 109, wherein the at least one acidulant is phosphoric acid, the at least one water-soluble crystalline compound is mannitol and wherein the chewing gum further contains an acid-sensitive flavor.
111. The process of claim 110, wherein the chewing gum also contains kaolin.
112. The chewing gum of claim 93, wherein the at least one acidulant is phosphoric acid, the at least one water-soluble crystalline compound is mannitol and the acid-sensitive additive is a flavor.
113. The process of claim 112, wherein the chewing gum also contains kaolin.
114. A chewing gum containing the co-processed composition of claim 99.